

FIBRE HEMP

A NEW INDUSTRY FOR AUSTRALIA?

The marijuana debate is beginning again ...

but this time the debate centres on the commercial and industrial use of the plant's fibre.

Fibre Hemp is a better source of pulp for paper-making than timber ...

and that's not all ...

by Dr A. J. Katelaris

The first European Conference on Industrial Crops was held in Maastricht, the Netherlands, in November of last year. One of the main items discussed at the conference was the Dutch government's hemp project. This is a four-year project investigating the potential for developing an ecologically benign and long-term sustainable non-wood paper industry utilising Indian hemp, *Cannabis sativa*, as the principal feedstock.

The Dutch government has seriously committed itself to reducing the volume of toxic chemicals used by the agricultural community, and at the same time providing farmers with an additional source of income. They have identified cannabis as the crop most likely to achieve these objectives, by providing a rotation crop between beet, potato and cereal crops to reduce the soil nematode load and other pests—and paper as the most likely profitable product, due to dwindling forest resources and increasing world demand for paper products.

The project is comprehensive and includes plant breeding, agronomy, logistics and pulping technologies. Included in this last category is detailed evaluation of mechanical, alkaline chemical and organosolv pulping methods. The Kraft paper-making process, which is the method proposed for new Australian mills, is now thoroughly discredited in Europe, with a total ban on planning and construction of this type of mill.

The United Nations Single Convention on Drug Use specifically exempts the industrial cultivation of cannabis from prohibition (see Article 28.2 of the Convention). The European Community, mindful of the economic potential of Indian hemp and in accordance with the intentions of the Single Convention, has formulated regulations for the industrial cultivation of cannabis. Cultivars producing less than 0.3% total alkaloid content are scheduled as a fibre crop, and cultivation is not only permitted but in some cases subsidised.

In France, 8,000 hectares are cultivated annually under the guidance of the *Fédération Nationale de Production Chanvre* for the production of speciality papers. In the Ukraine, annual production is over 60,000 hectares, used mostly for heavy-duty fabrics, though research is now being directed to paper manufacture.

Hemp stalks are composed of 30% bast fibre, the premier paper-making fibre used for best stationery and archival purposes, or for banknotes, filter paper and the like. The remainder is hurd, or short-length fibre. With modern methods of production, all grades of paper can be produced by blending these in various proportions. Cannabis hemp will produce approximately three to four times as much fibre per hectare as our current forest practices.

Cannabis cloth is of a high quality and rivals the best linens produced from flax or cotton. Cannabis yields two to three times as much fibre per hectare as cotton, and has the added important

benefit of being free from the residues of the herbicides and insecticides that are a feature of cotton production.

In 1990 a study was commissioned by the Minister for Energy into the prospects of developing an ethanol production capacity in New South Wales to supply environmentally safer vehicular fuel, such as bioethanol, E10%. The addition of 10% aqueous alcohol to an internal combustion engine can eliminate the need for any and all lead additives, whilst improving the efficiency of the engine and reducing levels of non-lead emissions.

The key areas identified by this comprehensive study were recommendations to reduce production costs by identifying new, high-yielding ligno-cellulosic crops. A key feature of the analysis was selection of crops that would yield secondary harvests to enhance the economic viability of the project. In Northern NSW, cannabis could easily yield twenty tonnes per hectare of dry stem material annually, being exceptionally rich in cellulose, whilst top-cutting of the leaf crown and seed heads would supply a high-value stock feedcake and oil source.

Hemp seed oil has been used for millennia as food, both human and animal, by many cultures of the world. According to United States Department of Agriculture documentation, the early settlers of that country depended on cannabis to provide many of their essential needs, including the canvas used on covered wagons, clothing such as the original Levi's jeans, food, medicine and oil for lighting, paints, lacquers and varnishes.

Most of the paper from the last century, especially the archival and high-quality book paper, was fashioned from cannabis fibre. In 1938, *Popular Mechanics* magazine stated that there were then at least 5,000 items of commercial importance manufactured from different parts of the cannabis plant.

Modern scholars are re-appraising the historical basis of the cannabis/hemp prohibition in the light of its extraordinary industrial potential and its long history in the service of mankind. Until the latter part of the nineteenth century, Indian hemp was one of the world's most cultivated crops and its fibre was one of the world's most traded commodities.

Literally millions of acres were cultivated annually to supply sail and rigging for the world's navies. Being the strongest and most durable natural fibre known to humanity, it alone could endure the rigours of nautical application. The demand for hemp was reduced with the replacement of wind power by steam, and was further reduced by the failure to develop efficient, high-output machinery for processing the fibre, as the cotton gin had done for that crop. Manila hemp, though an inferior fibre, was produced more cheaply due to the exploitation of the local 'coolie' labour, and synthetic fibres had just been developed by the chemical conglomerate Du Pont.

Until the 1930s cannabis was an essential part of the world's agricultural and economic production. The first law enacted in the United States concern-

ing cannabis cultivation was in 1631. Such was the importance of the plant to the colonies that the law actually prescribed financial penalties in the form of punitive taxation for those who did not grow sufficient cannabis!

In the early 1920s, a number of successful prototypes of efficient hemp-processing machines, known as decorticators, were developed. This development made a resurgence of cannabis to its position of eminence in agriculture and commerce likely, seriously threatening the business empires of Randolph Hearst and his colleague Du Pont, by replacing many of their chemical products with natural and safer alternatives.

Hearst used the vast resources of his newspaper chain, printed as they were on chemical wood pulp, to disseminate misinformation and inflame racial hatred against the Blacks and Hispanics, then the main users of marijuana in that country. So, what purported to be high-minded legislation for the public's benefit was in fact a callous gambit to ensure an industrial monopoly for the emerging petrochemical industries. This is a shocking truth but it is a truth that stands up under scrutiny.

So, there are the facts. Do our farmers need a new and highly profitable new crop? Historical and current agronomic data indicate that cannabis cultivation has many advantages.

Hemp is a hardy and adaptable crop able to accommodate to a range of growing situations. It is autocompatible and rarely troubled by insect pests or disease. Cannabis, when sown densely as is the practice in fibre production, acts as an efficient smother crop. Several rotations of cannabis can clear a field of weeds, leaving the ground improved for subsequent crops. This,

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Somerville

along with a deep and vigorous tap root which remains in the soil after harvest, will actually improve soil structure in long-term cultivation.

Would the country benefit from the introduction of a paper-pulp industry employing thousands of people more than the capital-intensive Kraft mills, and without the insidious problems caused by the accumulation of dioxin and other as yet not even categorised organochlorides?

The future of Australia is in the balance. Our balance of trade deficit is a staggering \$145 billion and rising at a frightening rate, whilst our traditional export commodities are attracting very low prices and suffering severe dislocation due to United States and European trade policies. The export of crude agricultural products such as woodchips derived from old-growth forests inflicts maximum environmental harm, whilst returning very little wealth to the country.

For example, we sell our old-growth forests as woodchip for \$60/ton, whereas refined bast fibre from hemp or kenaf is worth \$400/ton, and a high-quality pulp, such as organosolv, from this fibre could fetch over \$1,500/ton on export markets.

During the Second World War, the United States Department of Agriculture, finding itself short of strong fibre for the production of essential items, initiated the "Hemp for Victory" programme. Output of American-grown cannabis was boosted from nil in 1940 to over a quarter of a million acres in 1943. This programme was the subject of a documentary/educational film designed to re-educate the American farmers about this "ancient and versatile crop".

After the war, the military-industrial complex, again in control of the petrochemical resources and again fearing competition from natural products, attempted to destroy all traces of the industry and the film. This included erasing it from the Congressional Library electronic files. An old copy was found in a catalogue reference on a card file. Following a court order, the department was forced to admit its actions, and the film has now been officially recognised.

This Orwellian action in attempting to rewrite history is not an isolated event. In the 1970s President Richard Nixon ordered

that all work that had found potentially therapeutic applications or other beneficial effects of cannabis, was to be deleted from the literature. Of course, this type of manipulation was more usually associated with eastern bloc countries, but in the war on drugs the first casualty is truth.

There are now hundreds of research papers published in the world literature on the applications of cannabis fibre for paper-making. Only minor alterations are required to optimise production to a particular situation. Countries around the world and states in Australia are finding that a relaxation of prohibition, such as the Cannabis Expiation Notice System in South Australia (so that those interested can grow up to half a dozen plants), does not lead to increased usage in the community, but

has tremendous social advantage with savings of many millions of dollars in jail costs, a major redistribution of police manpower into areas of more importance—such as crimes of violence—and an enhanced public image of the police force, as a major area of potential corruption is removed.

The time to take a rational view of cannabis has arrived. The prohibition of cannabis is incompatible with public welfare. The alcohol and tobacco industries kill 23,000 Australians each year, and cost the country over \$6 billion annually in medical costs alone. They contribute only \$800 million in taxes paid as excise.

The legislative vendetta against cannabis was originally applied by a series of lies and the worst type of racial vilification in order to gain an advantage for petrochemical items over natural fibres. Some public officials have been completely brainwashed by fifty years of propaganda, and maintain the prohibition with a misguided fervour. This attitude must change. Cannabis hemp will return to agriculture. Whether Australia is one of the countries to take advantage of this new industry and invest early, remains to be seen—but we live in hope.

What we require is that our specially developed low-drug cultivars are placed in a separate schedule to the drug varieties so we can pursue our developmental work. This arrangement has worked in Europe for many years without any negative impact on society. Indeed, it is a profitable industry bringing benefit to thousands of people. ∞

